PASHENTSEV, Igor' Dmitriyevich; YEFIMOV, Vladimir Yur'yevich; BARTMER, A.Ye., red.; TELYASHOV, R.Kh., red.izd-va; BELOGUROVA, I.A., tekhn. red.

[Contactless numerical pulse-code generator and relay with great time delay] Beskontaktnyi generator impul'sov chislovogo koda i rele bol'shikh vyderzhek vremeni. Leningrad, 1962. 15 p. (Leningradskii dom nauchno-tekhnicheskoi propagandy. Obmen peredovym opytom. Seriia: Elementy avtomaticheskogo kontrolia i regulirovaniia, no.14) (MIRA 16:6)
(Electric relays) (Oscillators, Electric)

KOVALEVSKAYA, Vera Vladimirovna, kand. tekln. nauk; BARTMER, Aleksandr Yevgen'yevich, inzh.; KUTAKOVA, L.I., red; GRIGOR'YEVA, I.S., red. izd-va; BELOGUROVA, I.A., tekhn. red.

[The TsCh-1 digital discrete frequency meter] TSifrovoi diskretnyi chastotomer TsCh-1. Leningrad, 1962. 22p. (Leningradskii dom nauchno-tekhnicheskoi propagandy. Obmen peredovym opytom. Seriia: Pribory i elementy avtomatiki, no. 5) (MIRA 15:11)
(Frequency measurements)

44082

S/573/62/000/007/009/015
D201/D308

9.8300 (also 8912)

AUTHORS: Bartmer, A.Ye., Mikhaylova, N.D. and Chernyshev, V.Ye.

TITLE: Digital converters for the elimination of non-linearities in telemetering

SOURCE: Akademiya nauk SSSR. Institut elektromekhaniki. Sbornik rabot po voprosam elektromekhaniki. no. 7, 1962. Avtomatizatsiya, telemekhanizatsiya i priborostroyeniye, 314-322

TEXT: The authors show that the linearization of the frequency type of measuring transducers may be achieved by the application of telemetering of a digital frequency meter. Such a frequency meter consists of a reference crystal oscillator, two counters and a coincidence circuit, in which the frequency is measured by counting the number of periods of voltage over a calibrated time interval. By introducing certain constants into the two counters, their initial readings and their slopes become changed. If the output

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Digital converters ...

frequency from the transducer is a nonlinear function of the measured quantity, the introduction of constants makes it possible to reproduce a function which is inverse to the transducer function. The reproduction can be made either in piecewise approximation over a certain (small) frequency range or, to any required degree of accuracy, over the whole frequency range by means of expanding the inverse function into a power series. Experiments with a digital frequency meter have proved the validity of the above mentioned. There are 5 figures.

Card 2/2

BARTMER, A.Ye.

Methodological errors of digital phase and frequency measuring devices. Sbor.rab.po vop.elektromekh. no.7:335-343 '62.
(MIRA 16:1)
(Frequency measurement) (Electronic measurements)

BARTMER, A.Ye.

Analysis of the discreteness of a telemetering system with a frequency input parametron and elimination of transducer nonlinearity. Sbor. rab. po vop. elektromekh. no.9:233-238 '63. (MIRA 17:2)

L 42188-66 EWT(1) GD

ACC NR: AT6008927 SOURCE CODE: UR/0000/65/000/000/0119/0125

AUTHOR: Ambrosovich, V. D.; Bartmer, A. Ye.; Mikhaylova, N. D.

ORG: none

TITLE: Numeral display panel for teleinformation systems

SOURCE: AN SSSR. Institut elektromekhaniki. Avtomaticheskiye i teleinformatsionnyye sistemy (Automatic and teleinformation systems). Moscow, Izd-vo Nauka, 1965, 119-125

TOPIC TAGS: display panel, signal processing, information processing, pulse coding

ABSTRACT: A remote character-display system is briefly considered which uses a telegraph-type pulse code and is intended for receiving, storing, and displaying on a panel the information sent from a central station. The information is transmitted, over a telephone line, in case of emergency or on request from the

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ACC NR: AT6008927

display station. The system comprises (a block diagram is shown) a control unit, a shaping unit, a code distributor, a potential distributor, an internal-storage unit, a luminous display panel, and a power-supply unit. Normally, the line is used for two-way telephone traffic; the latter may be broken for display signal transmission. Principal circuit diagrams of the shaping unit and code distributor are explained. Orig. art. has: 3 figures.

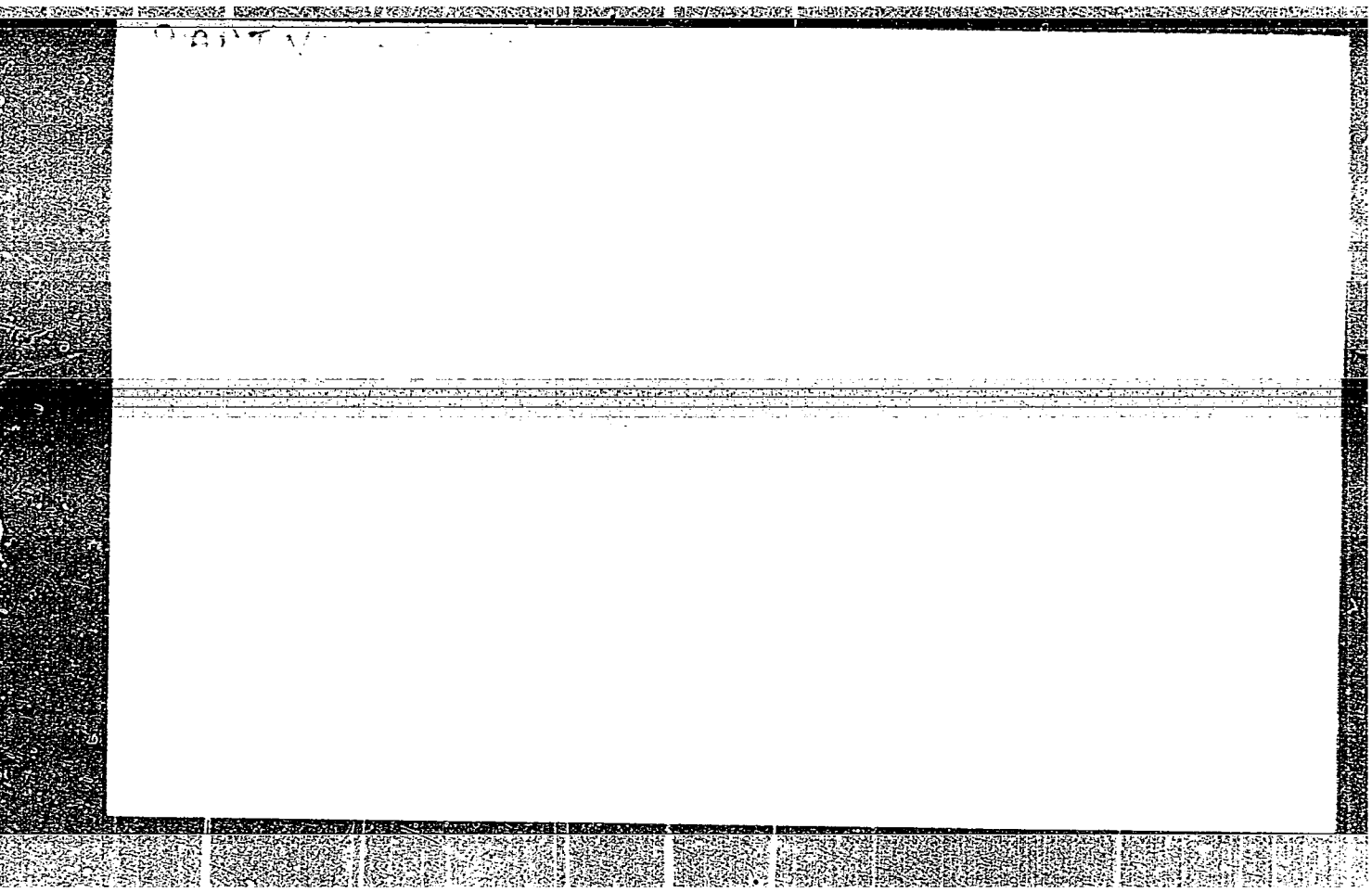
SUB CODE: 09 / SUBM DATE: 14Jul65

ZEBROWSKI, Tadeusz; PIENIAZEK, Janina; BOROWIECKA, Anna; NAWROT, Augustyn; BARTNICKA, Janina

Late results of the treatment of acute pulmonary tuberculosis in guinea pigs with isonicotinic acid hydrazide administered once every one and three days. Gruzlica 24 no.6:455-459 June 56.

1. Z Centralnego Laboratorium Panstwowego Zespolu Sanatorium Przeciwgruzliczych w Otwocku, Kierownik Laboratorium: dr. med. T. Zebrowski, Dyrektor Zespolu: dr. med. W. Zajaczkowski, Otwock, ul. Reymonta 53 m 5.

(TUBERCULOSIS, PULMONARY, experimental, eff. of isoniazid, admin. every one & three days (Pol))
(ISONIAZID, effects, on exper. pulm. tuberc., admin. every one & three days (Pol))



APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000203730007-9"

CA BARTNICKI, JULIAN 23

Achievements of Polish paper industry in the first half of 1947. Julian Bartnicki. *Przegląd Papier* 3, 125-9(1947). —The production in tons was: groundwood 40,231; sulfite pulp 29,404; kraft pulp 15,844; paper (all grades) 92,807; board 10,973. T. R. Zegree

Flocculation in [cellulose water] suspensions of large particles (Hulsky) 2. Evaluation of small-angle x-ray scattering by cellulose fibers for detn. of crystallite size (Heyn) 2. University training for paper industry (Jahn) 2. Cellulose in filter-paper chromatography (Burma) 7. Relative crystallinity of cellulose (Nickerson) 11A. Watersol. cellulose derivs. (Davies) 17. *Patents.* Identifying carbohydrates [in coat paper] (Laurent) 28. Polythene layer bonded [to paper or wood] by ethylene-vinyl acetate interpolymer adhesive (Chapman) 31. Protective coating [of cardboard] (Gralike) 25. Alginic acid and cellulose from algae (Société technique de recherches et d'exploitations) 13. Castor oil-organosilicon compds. [plasticizers for ethyl- and nitrocellulose] (Sowa) 10

1951

BARTNICKI, L.

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(4) Geo

Meteorological Abst.
Vol. 4 No. 11
Climatology and
Bioclimatology

551.582.2(438)

4.11-245

"Wiszniewski, W., Gumiński, Romuald and Bartnicki, L., Przyczynki do klimatologii Polski. [Contributions to the climatology of Poland.] *Poland. Państwowy Instytut Hydrologiczno-Meteorologiczny, Wiadomości Służby*, 1(5):345-372, 1949. mostly tables, charts (fold.), refs. English summary and headings. DWB—Tables of mean monthly and annual temp., mean diurnal, monthly and annual maxima, minima and range of temp.; absolute maxima and minima, ice days, frost days, hot days, very cold and very hot days, mean and extreme days of latest and earliest killing frost and length of frost-free period. Maps with mean monthly and annual actual isotherms (intervals 0.5°C) are added. Regarding the international agreement for the normal period 1901-30, the period used is 1881-1930, in accordance with the "Klimakunde des Deutschen Reiches" (1939) from which data for the former Eastern Germany are taken. A list is given showing the new Polish names of meteorological stations. *Subject Headings:* 1. Climate of Poland 2. Climatic data 3. Climatic charts 4. Temperature distribution 5. Poland.—*A.A.*

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000203730007-9"

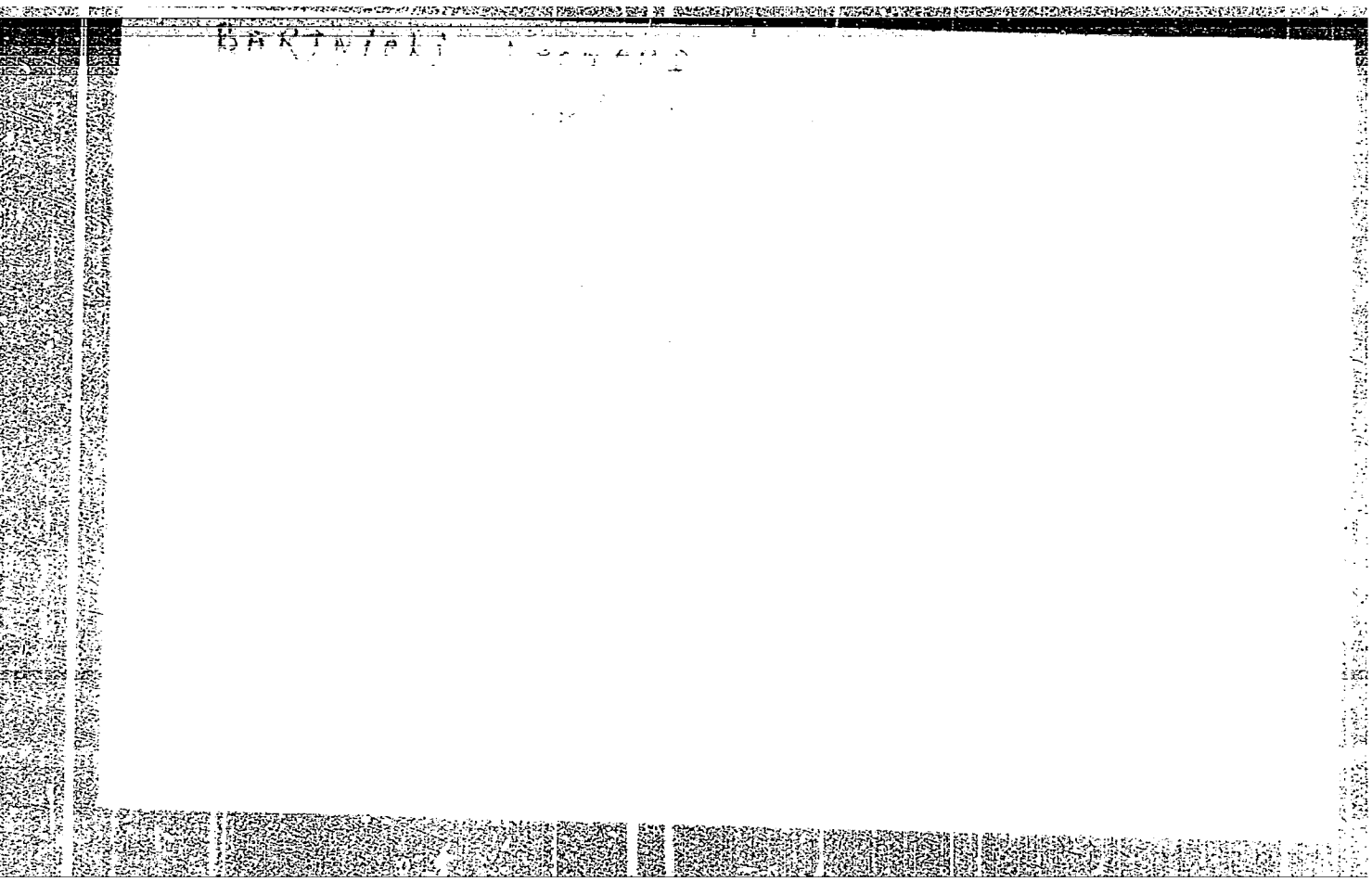
3

9.10-48 551.58(09)

Bartnicki, L. and Kühn, L., Drogi rozwoju klimatologii. [Lines of development of climatology.] *Przegląd Meteorologiczny i Hydrologiczny*, Warsaw. 7(3/4):173–181. 1954.

DLC, DWB—A theoretical discussion of the future lines of development of climatology, a branch of science that has been somewhat neglected in recent years. The discussion is based on the author's interpretation of deliberations that took place at the first session of the Climatological Commission of the International Meteorological Organization, and were published recently in the Bulletin of the OMM and are based on speeches and articles by THORNTHWAITE and A. H. GORDON. The paper concludes with a report on the proceedings of the session. *Subject Heading:* 1. Progress in climatology.—*A.M.P.*

July 30, 1959



BARTNICKI, L.

BARTNICKI, L., Climatologic problems concerning solid precipitations. p. 163.

Vol. 8, no. 2, 1955, Warszawa, Poland SCIENCE

SO: Monthly List of East European Accessions (EEAL), LC, Vol. 5, No.2 Feb. 1956

BARTNICKI, L.

BARTNICKI, L., The Congress of the International Union of Geodesy and Geophysics in Rome in 1954. p. 164.

Vol. 8, no. 2, 1955, Warszawa, Poland SCIENCE

SO: Monthly List of East European Accessions (EEAL), LC, Vol. 5, No. 2 Feb. 1956

BARTNICKI, L.

BARTNICKI, L., Conference of the British Commonwealth on Oceanography. p. 166.

Vol. 8, no. 2, 1955, Warszawa, Poland SCIENCE

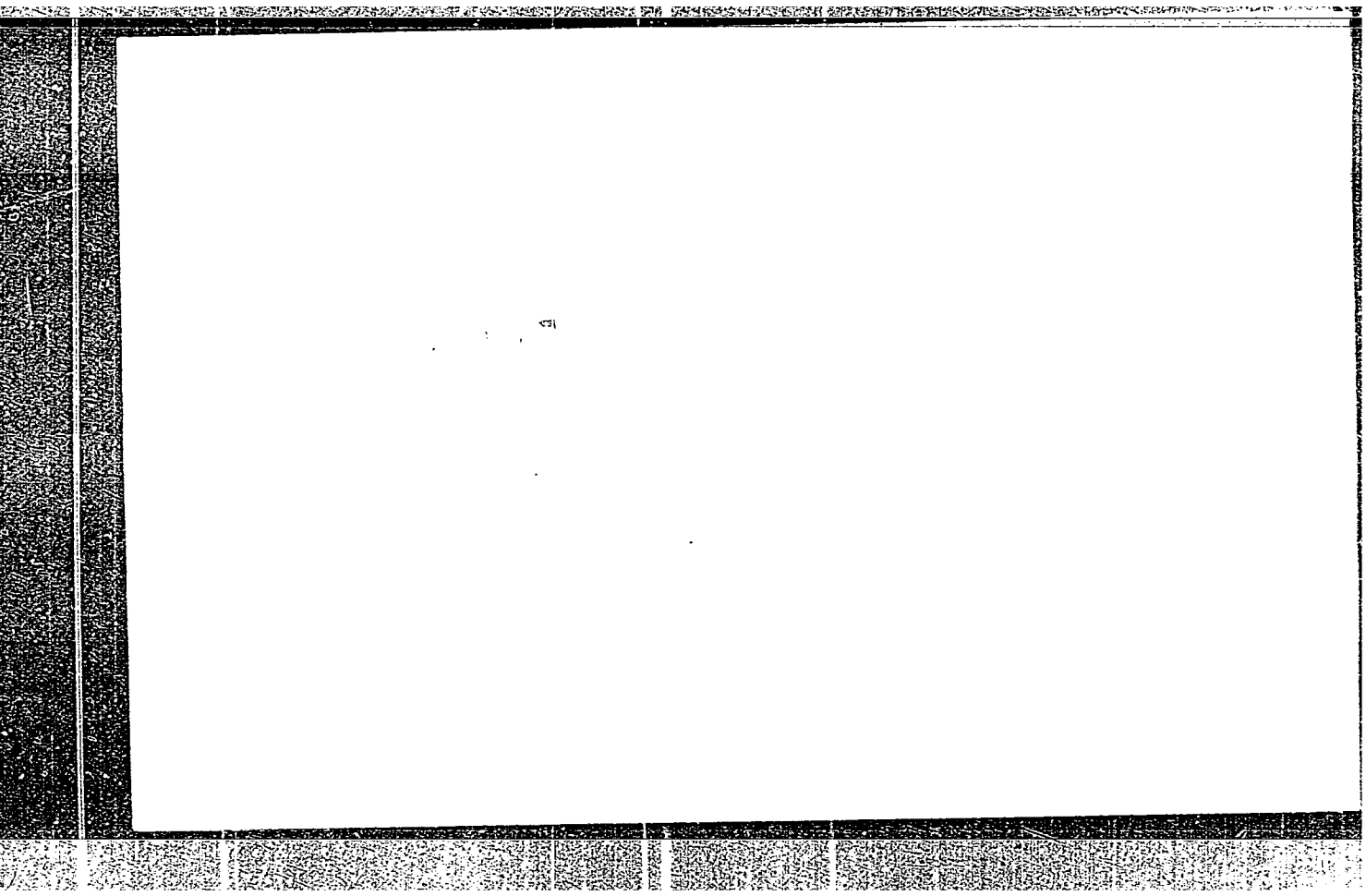
SO: Monthly List of East European Accessions (EEAL), LC, Vol. 5, No. 2. Feb. 1956

BARTNIK, J.

Grekowicz, M.; Bartnik, J.

"Applying the indicator method for the determination of digestion; chromic oxide used as an indicator." p. 15 (Roczniki, Vol. 5, No. 1, 1954, Warsaw)

SO: Monthly List of East European Accessions, Library of Congress, Vol. 3, No. 6, June. 1954, Uncl.



APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000203730007-9"

BARTNIK, Jan

Nutritive value of rye and its products. Pt.4. Roczn panst zakl hig 15 no.2:183-199 '64.

1. Department of Hygiene of Feeding, State Institute of Hygiene, Warsaw, Head: [prof. dr] A.Szczygiel.

BARTNIK, Jan

Nutritive value of rye as compared to wheat. Pt.2. Roczn. panstw. zakl. hig. 14 no.4:421-427 '65.

1. Z Instytutu Zywnosci i Zywienia w Warszawie (Dyrektor: prof. dr. A. Szczygiel).

BARTNIK, Jan

Expediency and possibilities of enriching cereals in Poland.
Roczn panstw zakl hig 14 no.2:145-152 '63

1. Department of Feeding Hygiene, State Institute of Hygiene, Warsaw.

BARTNIK, Jan

Nutritive value of rye and its products. Pt. 3. Roczn panstw zakl hig 15 no.1:91-101 '64.

1. Department of Feeding Hygiene, State Institute of Hygiene, Warsaw. Head of department: prof. dr A. Szczygiel.

HAHN, Witold E.; BARTNIK, Romuald; EPSZTAJN, Jan

Utilization of the Mannich reaction for the synthesis of heterocyclic systems. Pt.4. Rocz chemii 36 no.11:1645-1654 '62.

1. Katedra Chemii Organicznej, Uniwersytet, Lodz.

JANCZEWSKI, M.; BARTNIK, T.

Study on the influence of the molecular structure on the optical properties of sulfinyl compounds. Pt. II. Bul chim PAN 10 no.6: 271-273 '62.

1. Laboratoire de Chimie Organique, Universite M. Curie-Sklodowska, Lublin. Presented by T. Urbanski.

JANCZEWSKI, Marian; BARTNIK, Teresa

Optically active camphoric acids and some of their derivatives. Rocz chemii 36 no.7/8:1243-1253. '62.

1. Katedra Chemii Organicznej, Uniwersytet im. M.Curie-Sklodowskiej, Lublin.

BARTOK, Istvan; TOSZEGI, Anna; POKORNY, Lajos

Diphosphopyridine nucleotide-diaphorase activity in the regeneration of healthy and cirrhotic livers. Kiserl. orvostud. 16 no.1:83-89 Ja'64.

1. Szegedi Orvostudomanyi Egyetem Korbonctani es Korszovettani Intezete.

*

BARTNIK, Tadeusz; PIEKUTOWSKA, Barbara; CUCHRA, Alicja

Determination of health situation and of health work in the village.
Cesk. zdravot. 5 no.3:185-193 Mar 57.

1. Prace studentskeho vedeckeho krouzku pri katedre organisace zdravotnictvi (vedouci katedry lekarske akademie ve Varsave Doc. Dr. J. Krupinski).
(RURAL CONDITIONS,
pub. health in Poland (Pol))

KALINOWSKA, Zofia E.; BARTNIK-KURZAWIŃSKA, Jadwiga

Coulometric micro-determination of reserpine in various substances and in tablets. Acta pol. pharm. 19 no.1:45-53 '62.

1. Z Zakładu Chemii Farmaceutycznej Akademii Medycznej w Łodzi Kierownik: prof. dr K. Kalinowski.
(RESERPINE chem)

MGALOBLISHVILI, Nodar Mikhaylovich. Prinimali uchastiye: TUROV, V.M., inzh.-sant.tekhn.; BARTNIKAYTIS, V.A., inzh.-elektrik; BAULIN, V.A., red.; EL'KINA, E.M., tekhn. red.

[New types of central kitchens for public food-serving establishments; design and planning] Novye tipy zagotovochnykh predpriiatii obshchestvennogo pitaniia; voprosy proektirovaniia. Moskva, Gos. izd-vo torg. lit-ry, 1961. 140 p. (MIRA 15:1)
(Restaurants, lunchrooms, etc.)

~~Tadeusz~~ BARTNIKOWSKI, Tadeusz

5

Hydrazide of gluconic acid. Jan Swiderski and Tadeusz Bartnikowski (Acad. Med., Warsaw). *Acta Polon. Pharm.* 10, 151–3 (1953) (English summary).—Heating Et gluconate in alc. with the hydrate of hydrazine yielded the hydrazide of gluconic acid, m. 170°. Dild. gluconic acid was treated with the vapor of EtOH in a quantity 5 times larger than that of the gluconic acid to give Et gluconate, m. 62–3°. An attempt to obtain the Me gluconate by using an analogous procedure gave the lactone of gluconic acid, m. 130–5°. The hydrazide of gluconic acid was found to have minimal toxic properties and moderate activity against tubercle bacilli as compared with the hydrazide of isonicotinic acid. Mieczyslaw Sierp.

BARTNIKOWSKI, T.

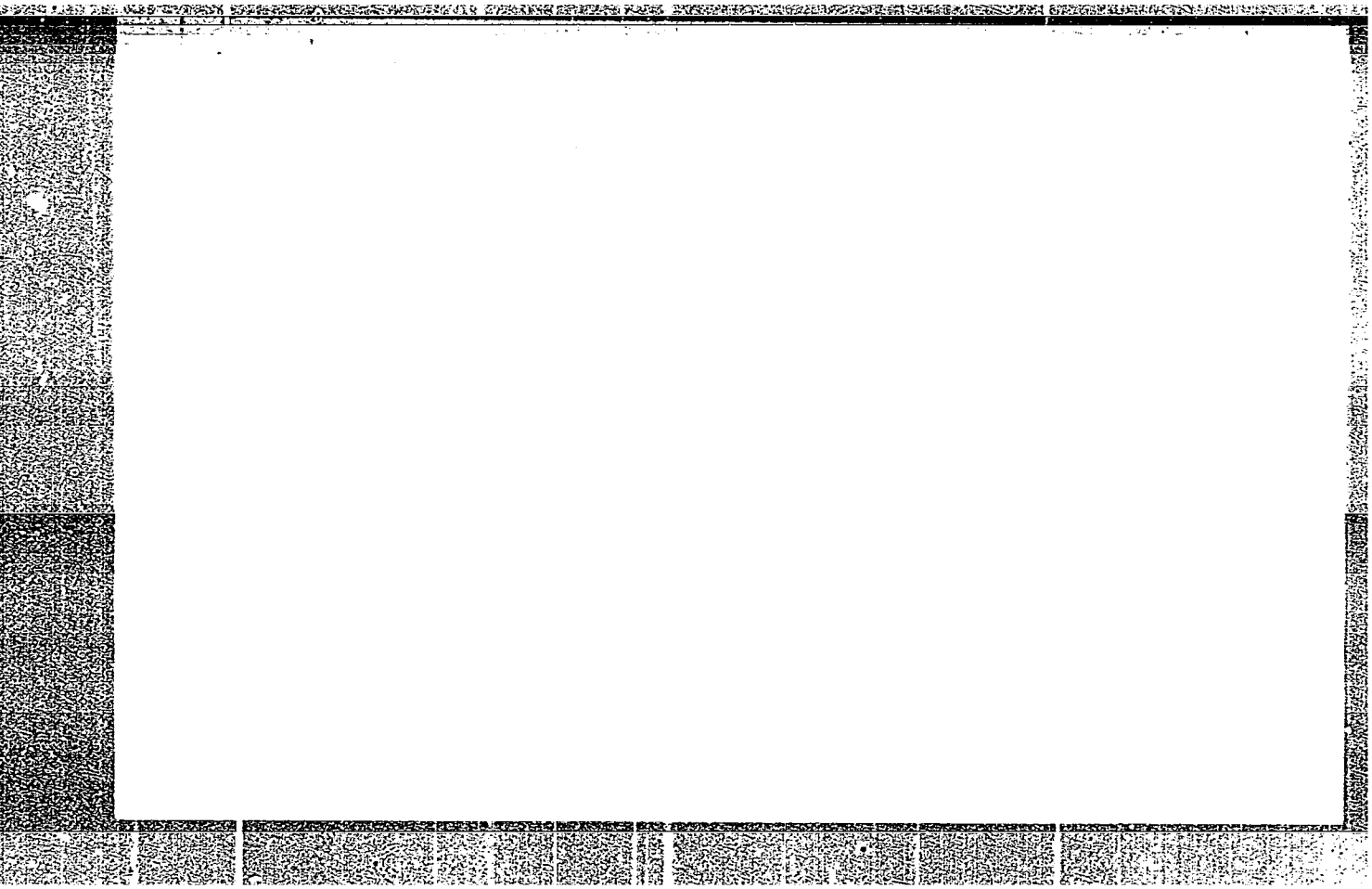
SWIDERSKI, J.; BARTNIKOWSKI, T.

Gluconic acid hydrazide. Acta Poloniae pharm. 10 no.3:151-153 1953. (CIML 25:5)

1. Of the Institute of Organic Chemistry (Head--Prof. Jan Swiderski, M.D.) of Warsaw Medical Academy.

BARTNINKAS, J.; MAZYLIS, A.; ORVYDAS, L.; GLEBAVICIENE, S., red.

[Protecting young stock from diseases] Gyvuliu prieauglio apsaugojimas nuo susirgimu. Vilnius, Leidykla "Mintis," 1965. 65 p. [In Lithuanian] (MIRA 18:7)



APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000203730007-9"

AUTHORS: Zhuze, V. P., Tsidil'kovskiy, I. M., Bartnitskaya, T. S. SOV/57-58-8-4/37

TITLE: Thermomagnetic Phenomena in Silver Telluride (Termomagnitnyye yavleniya v telluride serebra)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1958, Nr 8, pp. 1646 - 1650 (USSR)

ABSTRACT: This is a study of the Nernst-Ettinghausen-effect, of the thermo e.m.f., of the electric conductivity and of the Hall-(Kholl) effect in Ag_2Te and AgTe in the temperature interval of 120-600°K. The measuring methods are described in reference 5. The nature of the variations of the temperature dependence of σ and R agrees with observations made by Appel(Ref 8). Diagrams showing the temperature dependence of the dimensionless fields of the transverse and of the longitudinal Nernst-Ettinghausen effect ζ_{U_y} and ζ_{U_x}, respectively, and the temperature coefficient α of the thermo e.m.f. are given. The negative sign and the great absolute value of ζ_{U_y} at temperatures below 200°K can be explained by the effect of phonon

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drag $\ell_x > 0$. This indicates a considerable effect exerted by the phonon drag upon the longitudinal Nernst-Ettinghausen effect at low temperatures. In the range of 200-420°K $\ell_y > 0$. ℓ_y varies about as $T^{-2,5}$ and hence also $u \sim T^{-2,5}$. It is assumed that n = 0 that is to say that a carrier scattering on acoustic low-frequency oscillations corresponding to a covalent type of binding is prevalent. The relation $u \sim T^{-2,5}$ can be explained by a multiple phonon scattering of the carriers. Around 420°K the ℓ_y field decreases markedly and changes its sign. At a further temperature rise of up to $T \simeq 490$°K it first increases again, decreasing subsequently and passing through a minimum at $T \approx 550$°K. The jump-like variation of ℓ_y occurs at a temperature near the phase transition temperature. The inversion of the sign in the longitudinal Nernst-Ettinghausen effect in the point of phase transition undoubtedly indicates a change in the type of binding. The negative sign of ℓ_y above 420°K indicates that α-Ag_2Te is a semiconductor with a prevailing ion binding

the Debye temperature of which is less than 420°K. The theory of Howarth-Sondheimer (Ref 15) was not convincingly substantiated by experiments. According to the opinion of the authors it is unsuited for the computation of the parameters of semiconductors. The section of the thermo e.m.f. versus temperature curve shows a peculiar course in the range of high temperature. α is positive at $T \simeq 395°K$, reaches a maximum at 490°K (320μV/degree). At a further rise of temperature it decreases a little. This behaviour of $\alpha(T)$ can be explained by the assumption of a superposition of the electron thermo e.m.f. by a relatively great thermo e.m.f. caused by the mobile silver ions(Ludwig-Soret-effect) at high temperatures. The experimental results obtained from AgTe are given in short. The electric conductivity and the Hall-(Kholl) constant of AgTe vary continuously, whereas R decreases with a rise of temperature above 250°K and σ increases in the same temperature range. Contrary to evidence obtained by Appel R inverses it sign. The modification of the sign in the Hall-effect at a temperature rise suggests a transition into the range of mixed conductivity. The repeated inversion of the sign (from minus to plus) at 455°K is apparently determined by the Ludwig-

Thermomagnetic Phenomena in Silver Telluride SOV/57-58-8-4/37

Soret-effect as in Ag_2Te. It is shown that in AgTe ℓ_{U_y} varies continuously in the whole temperature range, remaining negative everywhere. Below 200°K the functions $\ell_{U_y}(T)$ and $\alpha(T)$ substantiate an influence of the phonon drag upon both effects. The law governing the decrease of α, reads as in Ag_2Te: $\alpha \sim T^{-\frac{1}{3}}$. The results confirm the existence of a prevailing ion binding. There are 2 figures and 17 references, 9 of which are Soviet.

SUBMITTED: December 12, 1957

Card 4/4

S/080/60/033/04/22/045

AUTHORS: Razumovskiy, S.D., Bartnitskiy, I.N., Lyutyy, V.P., Kirillova, L.P.

TITLE: The Hydrolysis of Ethylsulfates

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 4, pp 877 - 884

TEXT: The production of synthetic ethyl alcohol by the method of sulfuric acid absorption of ethylene passes through a stage of ethylsulfate formation. This is then subjected to hydrolysis. The hydrolysis rate is investigated here in relation to the temperature and dilution and with regard to studying the effect of these factors on the yields of alcohol and ether. It has been shown that the hydrolysis rate increases with the temperature. An extract obtained by the Orskiy zavod sinteticheskogo spirta (Orsk Plant of Synthetic Alcohol) with a specific gravity of 1.33 - 1.35 and a content of sulfuric acid of 70% and a saturation of 1.1 mole of ethylene per 1 mole of H_2SO_4 was hydrolyzed. Under industrial conditions it is expedient to carry out hydrolysis at a temperature of 100°C. Diethylsulfate is hydrolyzed considerably more quickly than monoethylsulfate; the hydrolysis rate of the extract in the whole is limited by the rate of monoethyl disappearance. Within the range of 70 - 100°C the yields of alcohol and ether do not change noticeably with the temperature; beyond 110°C the thermal decomposition of

Card 1/2

ethylsulfates starts with the liberation of C_2H_4 and SO_2 and the alcohol yield decreases. The maximum yeild of alcohol is obtained in case of the ratio extract : water = 1:1.33 based on weight. In the case of the change of this ratio the yields of alcohol decrease. The hydrolysis of the extract by water steam even after preliminary partial dolution with water produces no positive results: the yield is low. Ether is formed in the hydrolysis of the extract at the expense of diethylsulfate. The optimum conditions for hydrolysis of the extract in the industry are: a temperature of 100°C and a dilution with water in the ratio 1:1.1 based on weight.
There are: 3 graphs, 3 tables and 7 references, 4 of which are Soviet, 2 American and 1 German.

SUBMITTED: April 18, 1959

22972

S/166/61/000/002/003/006
B112/B202

9,4300

AUTHORS: Zvyagin, V. I., Lobanov, Ye. M., Leushkina, G., Bartnitskiy, I. N.

TITLE: Anomalously negative current and anomalously positive photocurrent

PERIODICAL: Izvestiya Akademii nauk UzSSR. Seriya fiziko-matematicheskikh nauk, no. 2, 1961, 29 - 32

TEXT: The authors observed the following behavior of germanium: If a voltage is applied, the inverse current increases to a certain maximum value after which it slowly decreases to a value near the saturation value of the current. Irradiation with visible light causes an increase of the inverse current up to a certain value which is much higher than the value of the ordinary positive photocurrent. Due to this behavior, the authors use the term "anomalously negative" current and "anomalously-positive" photocurrent in contrast to the ordinary current and photocurrent. An "anomalously positive" current and an "anomalously negative" photocurrent correspond to the "pre-anomalous" behavior. The analysis of experimental

Card 1/4

Anomalously negative...

data yielded more exact data on the energy scheme of the germanium surface. This scheme is reproduced in Fig. 3.

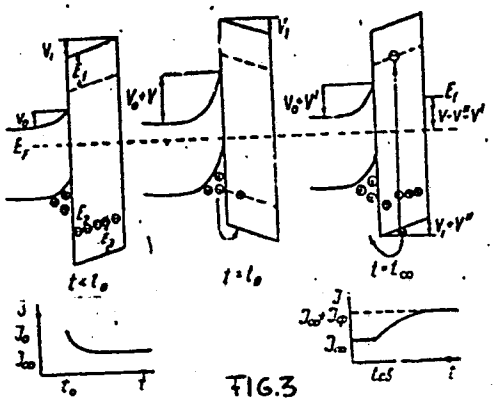

Fig. 3

Anomalously negative...

In equilibrium state, the potential difference between inversion layer with a potential $V_o + V'$ and the oxidation layer with a potential $V_1 + V''$ corresponds to the external voltage. The authors give empirical formulas for the transition characteristics of the anomalously negative current and the anomalously positive photocurrent:

$$I(t) = I_\infty - A_1 \ln(1 - C_1 e^{-\alpha_1 t})$$

characterizes the transition state of the anomalously negative current. I_∞ is the value of the dark current, A_1, C_1, α_1 are constants depending on voltage and temperature. The transition characteristics of the anomalously positive photocurrent is given by the formula:

$$I(t) = I_\infty + \left[I_{ph} + A_2 \ln(1 - C_2 e^{-\alpha_2 t})\right]$$

where I_{ph} is the value of the stationary photocurrent, A_2, C_2, α_2 are constants depending on voltage, temperature, and illumination. The inverse current which appears after the illumination is switched off, has the following transition characteristics:

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Anomalously negative...

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B112/B202

$$I(t) = I_{\infty} + I_{ph} - \left[I_{ph}^{1'} + A_3 \ln(1 - C_3 e^{-\alpha_3 t})\right].$$

There are 3 figures and 2 Soviet-bloc references.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics, Academy of Sciences, UzSSR)

SUBMITTED: November 10, 1960

Card 4/4

S/166/62/000/001/009/009
B125/B104

AUTHORS: Kist, A. A., Lobanov, Ye. M., Zvyagin, V. I., Bartnitskiy, I. N.

TITLE: Effect of gamma irradiation upon oxide films of germanium

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 1, 1962, 88-90

TEXT: The effect of gamma rays on germanium monoxide and germanium dioxide films produced by etching was quantitatively measured with a Geirovskiy micropolarograph. The monoxide - dioxide mixture produced by etching germanium powder in standard etching agent did not change under gamma irradiation in air, carbon dioxide, and in vacuum (10^{-4} torr) with 20, 60, 100, 150, and 200 million r. In the subsequent irradiation of the weighed portion of germanium etched in a standard reagent with 20, 30, 50, and 100 million r, the amount of germanium dioxide increases at doses of up to 40-50 million r, and then decreases again. The oxide film produced in etching agent no. 5 contains monoxide and dioxide in a ~1 : 1 ratio. While etching agent no. 5 gives rise to germanium monoxide,

Card 1/3

germanium dioxide is contained in the film in an equal amount. The anomalous current and the photocurrent are not exclusively due to the germanium monoxide. Similar phenomena are also observed when exposing the diodes to gamma irradiation (doses above 10^6 r). These anomalies disappear either entirely or partially at doses of more than 10^8 r. The irradiated photodiodes yield a photocurrent at such doses if the amount of germanium dioxide on the surface increases. The upper limit of the anomalous photocurrent shifts toward the visible region when etching agent no. 5 is used. Gamma irradiation first causes the oxide film to grow more considerably, but the secondary fast electrons then again partly destroy the oxide film. As a result, the oxide film becomes eventually thinner. If present considerations are correct, germanium diodes are made insensitive also to intense radiations in that the oxide film is prevented from growing all throughout the dose range. There are 1 figure, 1 table, and 8 references: 2 Soviet and 6 non-Soviet. The four references to English-language publications read as follows: S. I. Ellis, Appl. Phys. 1957, 11, 1262, 28; I. Everest, J. Chem. Soc., Febr. 1953, 660; I. Bardet, Tchakarian A. C. R., 1928, 637, 186; L. Dennis, Xules R. J. Am. Soc., 1930, 3554, 52.

Effect of gamma irradiation ...

S/166/62/000/001/009/009
B125/B104

ASSOCIATION: Akademiya nauk UzSSR (Academy of Sciences of the Uzbekskaya SSR)

SUBMITTED: August 25, 1961

Card 3/3

AMIRKHANOV, Kh.I.; BRANDT, S.B.; BARTNITSKIY, Ye.N.

Some problems relative to the theory of the argon method of the determination of the absolute age of rocks. Trudy Geol.inst.-Dag.fil. AN SSSR 1:175-187 '57. (MIRA 14:9)
(Geological time) (Argon)

AMIRKHANOV, Kh.I.; BRANDT, S.B.; BARTNITSKIY, Ye.N.; ANOKHINA, L.K.; IVANOV, V.S.

Diffusion of the radiogenic argon in micas. Trudy Geol.inst. Dag.fil. AN SSSR 1:188-193 '57. (MIRA 14:9)
(Diffusion) (Argon) (Mica)

AMIRKHANOV, Kh.I.; BRANDT, S.B.; BARTNITSKIY, Ye.N.; GURVICH, V.S.; GASANOV, S.A.; IVANOV, V.S.

Thermal stability of radiogenic argon in the dispersion micas. Trudy Geol.inst.Dag.fil. AN SSSR 1:194-199 '57. (MIRA 14:9)
(Argon) (Mica)

SOV/11-58-11-9/14

AUTHORS: Amirkhanov, Kh.I., Brandt, S.B., Bartnitskiy, Ye.N.

TITLE: The Determination of the Absolute Age of Potash Feldspars by the Argon Method (K opredeleniyu absolutnogo vozrasta kaliyevykh polevykh shpatov argonovym metodom)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geologicheskaya, 1958, Nr 11, pp 110 - 112 (USSR)

ABSTRACT: The authors propose a method to determine the absolute age of potash feldspars by the ratio of A^{40} and K^{40} in the permanent zone of a given sample. There is 1 graph, 1 table, 4 references, 1 of which is Soviet, 1 German and 2 American.

ASSOCIATION: Dagestanskiy filial AN SSSR, Makhachkala (The Dagestan Branch of the AS USSR, Makhachkala)

SUBMITTED: June 5, 1958

1. Geology 2. Potassium carbonates 3. Age--Determination 4. Radioisotopes--Applications

Card 1/1

Bartnitskiy, Ye. N.

AUTHORS: Amirkhanov, Kh. I., Member of the AN Azerbaydzhan SSR, 20-2-33/60
Brandt, S. B., Bartnitskiy, Ye. N., Gurvich, V. S., Gasanov, S. A.

TITLE: Problem of the Preservation of Radiogenic Argon in Glauconites (K voprosu o sokhrannosti radiogennogo argona v glaukonitakh).

PERIODICAL: Doklady AN SSSR, 1958, Vol. 118, Nr 2, pp. 328-330 (USSR).

ABSTRACT: Glauconite was chosen for the determination of the absolute age of sedimentary rocks due to its great structural similarity with mica, especially with biotite. The first samples showed good results, as far as the agreement of the absolute age with the assumed geological age is concerned. Beside data on a good stability of the glauconite structure a weak potassium-linkage to the lattice (reference 4) is indicated. The preservation of potassium and thus also of radiogenic argon apparently depends on the state of dispersion of the micas. In glauconites from Dagestan sometimes very small contents to complete absence of radiogenic argon were determined. The method was described in earlier papers (references 7-9). In order to determine the problem mentioned in the title, the dependence of the separated radiogenic argon on the temperature of heating was investigated. Simultaneously samples for an X-ray structural analysis were produced. The remaining content of argon after 8 and 10 hours of heating at 100-1150°C is gi-

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ven in table and figure 1. About 2o°/o of radiogenic argon are already lost from glauconite at loo°C. At 5oo°C argon is entirely separated. Argon is, for instance, much more solidly bound to muscovite and microcline. Its linkage to the crystal lattice of glauconite, however, is very weak. As separation of argon already takes place before the destruction of the glauconite lattice, as the X-ray structural analysis (table 2) proves. When comparing the curves of the separation of radiogenic argon with those of the thermal analysis (reference 12,13) it will be seen that the 2 endothermic effects (between loo and 2oo°C, and between 5oo and 6oo°C, respectively) of the latter (separation of the adsorbed water and loss of the water of constitution) are in agreement with the peaks of the curve of the separation of argon. The loss of the adsorbed water apparently entails the loss of 2o°/o argon, whereas that of the water of constitution causes the separation of the argon residue. This also indicates a weak argon- and possibly also a weak potassium-linkage to the glauconite-lattice. Further investigations are necessary. For determining the absolute age of the sediments according to glauconites a sufficient knowledge of the geological history of every individual sample is necessary. Glauconite may possible be used as material for paleo-thermometric investigations.

Concerning the Problem of the Preservation of Radiogenic Argon in Glauconites. 20-2-35/60

There are 2 figures, 2 tables, and 13 references, 11 of which are Slavic.

ASSOCIATION: Dagestan Branch of the AS USSR (Dagestanskiy filial Akademii nauk SSSR).

SUBMITTED: June 22, 1956.

AVAILABLE: Library of Congress.

Card 3/3

BARTNITSKIY, Ye. N., Candidate Chem Sci (diss) -- "The retention of radiogenic argon in micas and feldspars". Makhachkala, 1959. 17 pp (Acad Sci USSR, Dagestan Affiliate), 150 copies (KL, No 24, 1959, 128)

3(8) SOV/11-59-3-8/17

AUTHORS: Amirkhanov, Kh.I., Brandt, S.B., Bartnitskiy, Ye.N., Gasanov, S.A., and Gurvich, V.S.

TITLE: The Mechanism of Radiogenic Argon Losses in Mica (O mekhanizme poter' radiogennogo argona v slyudakh)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geologicheskaya, 1959, Nr 3, pp 104-107 (USSR)

ABSTRACT: The thermic stability of radiogenic (r/g) argon was tested by the above-mentioned authors in dispersed mica. It showed that low-temperature losses (150 - 600 C) of r/g argon were incurred, beginning with grains of the 50-100 micron order. Graphical representations and equations were developed by having used as basis the Langmuir order:

$$\frac{v}{v_M} = \frac{bp}{1 + bp} \qquad (1)$$

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The Mechanism of Radiogenic Argon Losses in Mica

The coefficient b is subjected to the following temperature dependence:

$$b = \alpha \frac{e^{q/RT}}{T^{1/2}} \qquad (2)$$

Here $\frac{v}{v_M}$ = the relative quantity of the absorbed gas; p = pressure; α = numerical coefficient dependent upon the properties of the sorbent and of the gas to be absorbed; q = temperature of sorption. The

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value q/R has usually the order $10^3(\frac{10^{11}}{8,32 \cdot 10^7})$.
For the initial analysis it is possible to use $\alpha p = 30$. By using these tolerances, the authors transform (1) and (2), as above, applicably to this case:

$$\frac{A^{40}}{A^{40}_M} = \frac{30e^{1000/T}}{T^{1/2}(1 + \frac{30e^{1000/T}}{T^{1/2}})}$$

The authors arrived at the following conclusions:
1) Losses of radiogenic argon from mica up to a temperature of 600 C are incurred as a result of the desorption processes and are well described by the

The Mechanism of Radiogenic Argon Losses in Mica

isotherms of Langmuir; 2) losses of argon in mica resulting from a diffusion become perceptible only after a temperature of 600 C; 3) at normal temperatures, the diffusion coefficient in mica is not to exceed 10^{-31} cm^2/sec. There are 4 graphs and 6 Soviet references.

ASSOCIATION: Dagestanskiy filial AN SSSR, g. Makhachkala (The Dagestan Branch AS USSR, Makhachkala)

SUBMITTED: June 5, 1958.

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3(5)

AUTHORS: Amirkhanov, Kh. I., Brandt, S. B., Bartnitskiy, Ye. N., Voronovskiy, S. N. SOV/7-59-6-8/17

TITLE: On the Diffusion of Radiogenic Argon in Sylvites

PERIODICAL: Geokhimiya, 1959, Nr 6, pp 538 - 545 (USSR)

ABSTRACT: The diffusion constants of radiogenic argon, the activation energy of diffusion, the electrical conductivity of frequencies of 0 - 20 megacycles and their activation energy were measured on two different types of sylvite - red and pink - of the Solikamsk deposit in the temperature range of from 20 to 700°C. The diffusion mechanism of radiogenic argon was found to differ from the conductivity mechanism and the eigendiffusion of K^+. The activation energy of diffusion is at equal temperature higher than the activation energy of conductivity. Activation energy is not likely to decrease at low temperature (under 200°C). It is not possible to make spatial diffusion responsible for argon losses occurring in the course of geological evolution. The diffusion constant amounts to 10^{-30} cm^2/sec extrapolated to a temperature of 300°K. Diffusion according to pair vacancies and Schottky-defects is assumed to be the most probable diffusion mechanism. Argon losses by desorption at low temperature on one

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of the two sylvites may be explained by mosaic-structure.
There are 5 figures and 11 references, 5 of which are Soviet.

ASSOCIATION: Dagestanskiy filial Akademii nauk SSSR, Makhachkala
(Dagestan Branch of the Academy of Sciences USSR, Makhachkala)

SUBMITTED: April 18, 1959.

AMIRKHANOV, Kh.I.; BRANDT, S.B.; BARTNITSKIY, Ye.N.; GASANOV, S.A.; GURVICH, V.S.

Mechanism of radiogenic argon losses in micas. Izv.AN SSSR. Ser.geol. 24 no.3:104-107 Mr '59. (MIRA 12:4)

1. Dagestanskiy filial AN SSSR, g. Makhachkala. (Mica) (Argon)

5(0)

AUTHORS: Amirkhanov, Kh. I., Academician, AzerbSSR, Brandt, S. D., Bartnitskiy, Ye. N.

SOV/20-125-6-48/61

TITLE: The Diffusion of Radiogenic Argon in Feldspars (Diffuziya radiogennogo argona v polevykh shpatakh)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 6, pp 1345-1347 (USSR)

ABSTRACT: It is known that considerable losses of radiogenic argon A^{40} formed in feldspars by the radioactive transformation of K^{40} occur in the last mentioned mineral. The linear approximations in the references 1,2 distort the separation mechanism of A^{40}. The authors give in this paper investigation results of the separation kinetics of A^{40} in two Precambrian feldspar samples (Ref 3). The figures 1 and 2 give the results. The diffusion equation for a spherical case (1) as well as the known dependence of the steady diffusion on the temperature (2) are used for the interpretation of the obtained curves. Figure 1 (sample Nr 1) shows that the heating curves have at 800 and 1100° horizontal sections of considerable length contrary to the dependence (1). The slope of the curve increases against

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the dependence 2 periodically, in intervals which are separated from one another by curves with a horizontal section, not gradually with the temperature. A part of the sample Nr 1 was pulverized in an agate mortar in order to clarify the nature of these horizontal sections. Portions of 1.5 g each were subjected to differently long heating. The determination results of the A^{40} which remained in these portions are indicated in figure 1 by crosses. The horizontal section is not shifted on the vertical line, but only prolongated in the direction of the ordinate axis. Thus its existence is caused by the structural peculiarities, not by the grain size. The beginning of the section is determined by the quantity D_t/r_o^2 in line with the equation (1). The process occurring at 800 and 1100° can be interpreted as rapidly dying down diffusion which exhausts the A^{40}-content in a certain stage. This stage is characterized by values of E and D_o typical of it. Therefore the curves have to be interpreted according to A^{40} which belongs to each single phase. Thus the sample Nr 1 has three phases (Fig 3: I and II - the numbers of the phases). Figure 4 shows an analogous sub-

division of the sample Nr 2. The slope of the curves in the figures 3 and 4 increases gradually for each phase with the increase of t. This makes their analysis in the terms of the equations (1) and (2) possible which confirms the rightness of the authors' interpretation. A raster was contructed from the equation (1) for different D-values in order to determine the value of D_t. The D_t-values were detected by applying this raster to the curves of the figures 3 and 4. 2 adjacent D_t-values from the equation (2) were determined. The obtained D_t- and E-values as well as the D_{273}-values, extrapolated according to the equation (2), were compiled in the table 1. This shows that each single phase is characterized only by the E-value typical of it. The separation of A^{40} is carried out at the mentioned temperatures by diffusion. The diffusion can, however, practically not influence the maintenance of A^{40} as it is shewn by the D_{273}-values for each phase. All losses of A^{40} in the course of the geological time are due to the separation from the "zero"-phase only. The variety of the feldspars is not exhausted by the two samples, though the figure and the

The Diffusion of Radiogenic Argon in Feldspars SOV/20-125-6-48/61

configurations of the phases differ in the two samples. There are 4 figures, 1 table, and 3 references, 1 of which is Soviet.

ASSOCIATION: Dagestanskiy filial Akademii nauk SSSR (Dagestan Branch of the Academy of Sciences USSR)

SUBMITTED: December 29, 1958

Card 4/4

3 (8)

AUTHORS: Amirkhanov, Kh. I., Academician of the AS AzerbSSR, Bartnitskiy, Ye. N., Brandt, S. B., Voytkevich, G. V.

SOV/20-126-1-44/62

TITLE: On the Migration of Argon and Helium in Certain Rocks and Minerals (O migratsii argona i geliya v nekotorykh porodakh i mineralakh)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 1, pp 160-162 (USSR)

ABSTRACT: The A- and He-separation from one and the same sample was investigated in order to define precisely the loss mechanism of the two radiogenic gases mentioned in the title. The authors used for this purpose carbonaceous schist, hornblende, and Precambrian pyroxene. They used the mass-spectroscopic method of isotopic dilution (Ref 1) which was somewhat modified for this purpose. The measuring results are given in figures 1-3. The diffusion coefficients D and in several cases the activation energy E can be determined from these curves. The formula of the spherical diffusion (2) was used for the calculation of D.

The quantity of the radiogenic A^{40} was measured by the usual

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method; the He^4-quantity according to the formula (1). Figure 1 shows curves for the carbonaceous schist, figure 2 for hornblende from granite-pegmatite, figure 3 for pyroxene. Equal D-values of argon and helium for hornblende and pyroxene prove that the migration of the radiogenic gases is caused by other reasons, not by the nature of the atoms A^{40} and He^4. It is possible that the nodal vacancies (holes) shift in the crystalline lattice of the mineral. Their quantity increases with the temperature rise. They seize and "transport" the atoms of radiogenic gases. A certain difference of the D-value for A and He in the carbonaceous schists is apparently due to the occurrence of several phases in these rocks in which the gases may be differently distributed. The boundary layers between the individual phases are apt to cause considerable losses in A^{40} and He^4 as well in the case of low temperatures. The E- and D-values for pyroxene prove that the radiogenic gases are fully preserved in this rock. The authors draw from the aforesaid facts the conclusion that the absolute age is to be determined by the argon- and helium

On the Migration of Argon and Helium in Certain Rocks and Minerals SOV/20-126-1-44/62

method only in the case of samples which were first investigated for the preservation of the radiogenic gases. There are 3 figures and 1 Soviet reference.

ASSOCIATION: Dagestanskiy filial Akademii nauk SSSR (Dagestan Branch of the Academy of Sciences, USSR)

SUBMITTED: December 29, 1958

Card 3/3

AMIRKHANOV, Khabibula Ibragimovich; BRANDT, Sergey Borisovich; BARTNITSKIY, Yevgeniy Nikolayevich; KLEYZMER, I.A., tekhn.red.

[Radiogenic argon in minerals and rocks] Radiogennyi argon v mineralakh i gornykh porodakh. Predisl.D.I.Shcherbakova. Makhachkala, Akad.nauk SSSR, Dagestanskii filial, 1960. 200 p. (MIRA 14:4)

(Argon) (Radioargon dating)

S/169/61/000/008/003/053
A006/A101

AUTHORS: Amirkhanov, Kh. I., Brandt, S. B., Bartnitskiy, Ye. N., Gurvich, V. S., Gasanov, S. A.

TITLE: On the problem of preservation of radiogenic argon in glauconites

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 8, 1961, 4-5, abstract 8A37 ("Tr. 6-y sessii Komis. po opredeleniyu absolyutn. vozrasta geol. formatsiy", 1957, Moscow, AN SSSR, 1960, 202-207)

TEXT: The basic premise of using glauconites to determine the absolute age by the K-argon method, is the similarity of its structure with the mica structure. The authors studied the dependence between the quantity of radiogenic argon liberated from glauconite and the heating temperature within a range of 100 - 1,500°C. Argon was determined by the method of isotopic dilution. The data obtained are compared with the known E. K. Gerling curves showing argon liberation from mica and microclines. At 100°C the glauconite loses about 20% argon, whereas argon liberation from microcline and muscovite begins at 400 and 600°C respectively. At 500°C, 100% argon are liberated from glauconite, whereas 8 hour heating of microcline at 1,200°C entails only 76% argon loss.

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S/169/61/000/008/003/053
A006/A101

On the problem of preservation of radiogenic ...

Debyegrams show that argon loss occurs prior to the beginning of destruction of the glauconite lattice. The peaks on the argon liberation curve (at 100 and 500°C) coincide with two endothermic effects on the glauconite thermogram; they correspond to the separation of adsorbed and constitution water. All this indicates a weak bonding of argon in the glauconite lattice and requires a careful study of the geological history of each specimen when interpreting the K-argon ages of glauconite. The weak bonding of argon in glauconite may possibly be caused by small grain sizes (5 - 100 μ) of the latter, since processes of ion and atom loss and substitution occur mainly on the crystal surfaces.

I. Chernushev

[Abstracter's note: Complete translation]

Card 2/2

AMIRKHANOV, Kh.I.; BRANDT, S.B.; BARTNITSKIY, Ye.N.

E.K. Gerling's method of determining the activation energy of radiogenic gases in minerals. Geokhimiia no.7:646-649. '60.
(MIRA 13:11)

(Argon) (Helium) (Diffusion)

AMIRKHANOV, Kh.I.; BRANDT, S.B.; BARTNITSKIY, Ye.N.; VORONOVSKIY, S.N.; ZAR'YANOV, V.I.

Sound foundation for geochronometry. Biul.Kom.po opr.abs.vozr.geol. form. no.5:53-59 '62. (MIRA 15:11)
(Geological time)

BRANDT, S.B.; BARTNITSKIY, Ye.N.

Losses of radiogenic argon in potash-soda feldspars during heat activation. Izv. AN SSSR. Ser.geol. 27 no.12:23-31 D '62. (MIRA 16:2)

1. Dagestanskiy filial AN SSSR, Makhachkala.
(Argon) (Feldspar)

SEMENENKO, A.P., akademik, otv. red.; SHCHERBAK, N.P., kand. geol.-miner. nauk, red.; BARTNITSKIY, Ye.N., kand. khim. nauk, red.; LOGVIN, E.I., inzh., red.; CHEKHOVICH, N.Ya., red.

[Geochronology of the Precambrian of the Ukraine] Geokhronologiia dokembriia Ukrainy. Kiev, Naukova dumka, 1965. 261 p. (MIRA 18:9)

1. Akademiya nauk URSR, Kiev. Instytut geologichnykh nauk.
2. Akademiya nauk Ukr.SSSR (for Semenenko).

BOROKHOV, M. Kh., kand. med. nauk; BARTNOVSKAYA, L. M.; YADGAROV, Ye. M.

Prevention of industrial injuries in some textile enterprises in the Uzbek S.S.R. Med. zhur. Uzb. no.6:10-13 Je '62. (MIRA 15:7)

1. Iz kafedry obshchey khirurgii sanitarnogo i pediatricheskogo fakul'tetov (zav. - prof. A. M. Geller) Tashkentskogo gosudarstvennogo meditsinskogo instituta.

(UZBEKISTAN—TEXTILE INDUSTRY—SAFETY MEASURES)

BARTNOVSKIY, A.L.; BOBORITSKIY, F.M.; KOZIN, V.O.; LASTOVSKIY, M.S.; SELIVANETS, N.Ye.; STROGANOV, L.P., inzh., red.; VKRINA, G.P., tekhn. red.

[Communications in transportation] Transportnaia sviaz'. Moskva, Gos. transp. zhel-dor. izd-vo, 1958. 255 p. (MIRA 11:7)
(Railroads--Communication systems)

BARTNOVSKIY, Aleksandr Leont'yevich; KOZIN, Vasiliy Onisimovich; KUCHEREN-KO, Sergey Aleksandrovich; BUZINIER, D.M., inzh., retsenzent; GRI-GOR'YEV, N.I., inzh., retsenzent; CHISTOV, G.I., inzh., retsenzent; SHTILLER, Ya.V., inzh., retsenzent; NOVIKAS, M.N., inzh., red.; BOBROVA, Ye.N., tekhn. red.

[Specialized measurements in communication systems, automatic control, and remote control] Spetsial'nye izmereniia v ustroistvakh sviazi, avtomatiki i telemekhaniki. Moskva, Vses. izdatel'sko-poligr. ob"edinenie M-va putei soobshcheniia, 1961. 251 p. (MIRA 14:8)

(Electronic measurements) (Railroads—Electronic equipment)

BARTNOVSKIY, Aleksandr Leont'yevich, inzh.; BOBORITSKIY, Fedor Mikhaylovich, inzh.; KOZIN, Vasiliy Onisimovich, inzh.; SELIVANETS, Nikolay Yemel'yanovich, inzh.; NOVIKAS, M.N., red.

[Transportation communication systems] Transportnaia sviaz'. [By] A.L.Bartnovskii i dr. Izd.2., perer. i dop. Moskva, Transport, 1964. 262 p. (MIRA 17:9)

ANDRIEVSKIY, Sergey Konstantinovich; BARTNOVSKIY, A.L.

[Practical manual for electrical engineering; a textbook for grade 10 of the secondary school] Praktikum po elektrotekhnike; uchebnoe posobie dlia uchashchikhsia X klassa srednei shkoly. Izd.3., perer. Moskva, Gos.uchebno-pedagog.izd-vo, 1960. 191 p. (MIRA 15:10)
(Electric engineering)

Bartnovs'kiy, D.L.

USSR/General Section - Problems of Teaching. A-5

Abs Jour : Referat Zhur - Fizika, No 1, 1958, 64

Author : Bartnovs'kiy, D.L.
Inst :
Title : Practical Course on Electric Wiring in the Pedagogical Institute.

Orig Pub : Nauk. zap- Kiivs'k. derzh. ped. in-t, 1957, 25, 169-202

Abstract : Description of the organization, procedure, and scope of the practical course.

Card 1/1

9.3150,24.2120

77847
SOV/57-30-3-13/15

AUTHORS: Gabovich, M. D., Bartnovskiy, O. A., Fedorus, Z. P.

TITLE: Sag of the Potential on the Axis of a Discharge at Electron Oscillation in a Magnetic Field

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol 30, Nr 3, pp 345-350 (USSR)

ABSTRACT: Kistemaker and Sneider (Physica, 19, 950, 1953) showed experimentally that in a discharge with electron oscillations in magnetic field potential on the axis of discharge may be considerably smaller than potential of anode. In the present paper the authors investigate causes for such a potential sag and examine conditions favoring effect. Figure 1 shows the diagram of experimental setup and measuring circuitry. In addition to cathode K and anode A, there are two reflectors O_1 and O_2 at the potential of the cathode of negative with respect to it. The cathode was either of tantalum, indirectly heated by bombardment of electrons originating on F or a directly-heated tungsten cathode. The

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whole 35 mm length of the system was in an uniform longitudinal magnetic field H variable 0-4,000 oersted. The behavior of anode current I_a, probe current I_p (at -80 v with respect to anode) and noise intensity in probe curcuit I_n as functions of magnetic field are presented in Fig. 2. For $I_H = 1$, $H \approx 500$ oersted. U_a was 300 v with respect to the cathode. The authors prove irregularities of the I_a curve are unambiguously related to noise intensity. They explain these irregularities by formation of a fundamental discharge column caused by axial oscillations of primary electrons in the raising magnetic field. At a certain optimum value of I_H the field starts substantially preventing plasma electrons from reaching the anode and produces a potential "groove." Its radial electrical field, in turn, facilitates motion of electrons toward the anode which was hampered by the presence of

Sag of the Potential on the Axis of a Discharge at Electron Oscillation in a Magnetic Field

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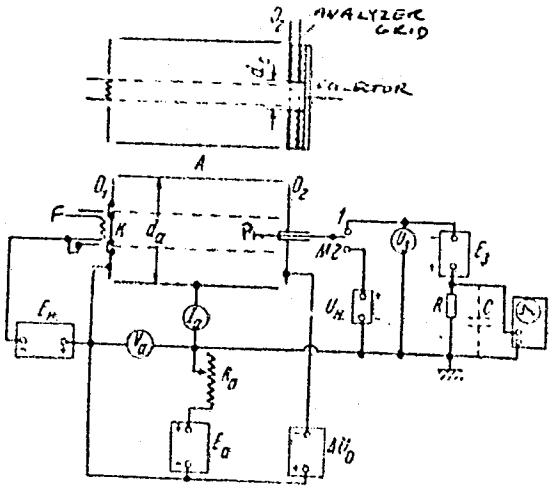

Card 3/11 Fig. 1.

Sag of the Potential on the Axis of a Discharge at Electron Oscillation in a Magnetic Field

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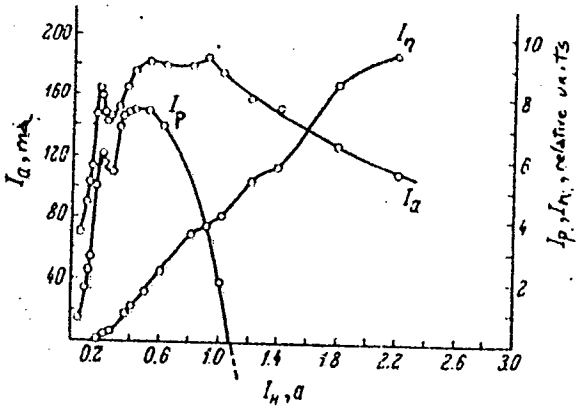

Card 4/11 Fig. 2.

magnetic field. Further increase of H produces an unstable discharge, causing the mentioned irregularities and noises. The probe current changes sign because of an increasing number of primary electrons reaching it and a decrease of potential of paraxial plasma. Further increase of the magnetic field finally takes over and decreases the anode current until discharge is apparently completely halted. To measure potential inside the plasma the authors developed a special thermal probe consisting of a tungsten disc 1 mm diam and 0.05 mm thick on a tungsten wire inside an insulating quartz tube. By a relay M (see Fig. 1) probe P is raised to a potential U_H during a time interval τ_1. The electron current bombarding the probe can heat it sufficiently to produce an appreciable electron emission. During the second half of the cycle τ_2 probe is at potential U_p and, if the heating effect is now lower than previously, emission will decrease. Now, in the

case of U_p being lower than plasma potential, decrease of emission is accompanied by a decrease of probe current while in $U_p \geq U$ plasma current changes sign and remains constant in time. The authors changed probe potential 20 times per second, observed current pattern on an oscilloscope, and registered plasma potential from those readings of the U_p voltmeter at which the decaying current pattern on the oscilloscope screen switched to the rectangular one. Results for measured potential U_a and plasma potential on discharge axis U_n are shown in Fig. 6 as a function of magnetization current I_H and diam of the anode. Analysis of results showed $\Delta U = U_a - U_n$ is a linear function of the square of the anode diam:

Sag of the Potential on the Axis of a Discharge at Electron Oscillation in a Magnetic Field

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SOV/57-30-3-13/15

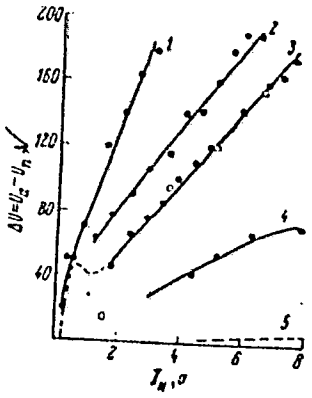

Fig. 6. (1) d_a = 4.0 cm (2) d_a = 3.4 cm (3) d_a = 2.7 cm (4) d_a = 1.8 cm (5) d_a = 1.0 cm

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Sag of the Potential on the Axis of a Discharge at Electron Oscillation in a Magnetic Field

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The authors discovered that radial potential drop is almost completely located outside the axial plasma of diam equal to diam of the cathode. They note, however, all measurements mentioned above were done in the presence of a perturbation caused by the presence of the probe. They circumvent this objectionable situation by developing a special setup consisting of a grid across an ϕ = 8 mm opening on the reflector O_2 followed by another analyzer grid and a collector. Distribution of potentials is shown on the right in Fig. 8. The authors assumed there would be an appreciable ion current on the collector only when potential of analyzer grid U_c is equal or smaller than potential of plasma U_n. Using these values they constructed the curves in Fig. 8 for an anode 2.7 cm diam. Extrapolated potential values in the manner indicated in Fig. 8 then yielded points marked by hollow circles in Fig. 6. The agreement between the two methods is apparently very good.

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Sag of the Potential on the Axis of a Discnarge at Electron Oscillation in a Magnetic Field

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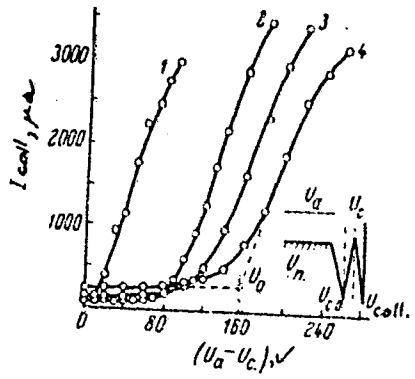

Fig. 8. (1) I_H = 1.5 a (2) I_H = 3.5 a (3) I_H = 5.0 a (4) I_H = 6.5 a

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Sag of the Potential on the Axis of a Discharge at Electron Oscillation in a Magnetic Field

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The authors finally did some theoretical calculations starting from the equation of radial electron current density

$$j_- = -D\frac{dn_-}{dr} + \frac{De}{kT} n_- \frac{dU}{dr} \qquad (1)$$

and the continuity equation

$$\frac{dj_-}{dr} + \frac{j_-}{r} = \beta n_- . \qquad (2)$$

Assuming n_- to be constant, they obtained a theoretical expression for $\triangle U$ in volts

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Sag of the Potential on the Axis of a Discharge at Electron Oscillation in a Magnetic Field

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$$\Delta U(v) \approx 10^{-3} \cdot H(\alpha) d_a^2 \qquad (5)$$

which for H = 1,500 oersted and d_a = 4 cm yields Δ U $\approx$ 240 v versus the experimentally measured value 180 v. The authors note relationship U = f(H, d_a^2) as well as value Δ U are in fair agreement with the experiment. The strong radial fields up to 100 v/cm are connected to a decrease of electron diffusion towards the anode. There are 8 figures; and 6 references, 3 Soviet, 1 Dutch, 1 German, and 1 U.S. The U.S. reference is: D. Bohm. The Characteristics of Electrical Discharges in Magnetic Fields. N. Y. 1949.

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